INCH-POUND

MIL-PRF-23648/3E
11 October 2002
SUPERSEDING
MIL-PRF-23648/3D
4 April 1995

PERFORMANCE SPECIFICATION

RESISTOR, THERMAL (THERMISTOR), INSULATED NEGATIVE TEMPERATURE COEFFICIENT STYLE RTH10

This specification is approved for use by all Departments
And Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for style RTH10 thermistor. This style is available in resistance ratios A, B, and C. The only terminal lead available is S type. Resistance tolerance versus temperature characteristics F, G, J, and K are applicable through the maximum temperature of 125°C.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-23648 - Resistors, Thermal (Thermistor), Insulated, General Specification for.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAT, Post Office Box 3990, Columbus Ohio 43216-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5905

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Document Automation and Production Service, Building 4D, (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

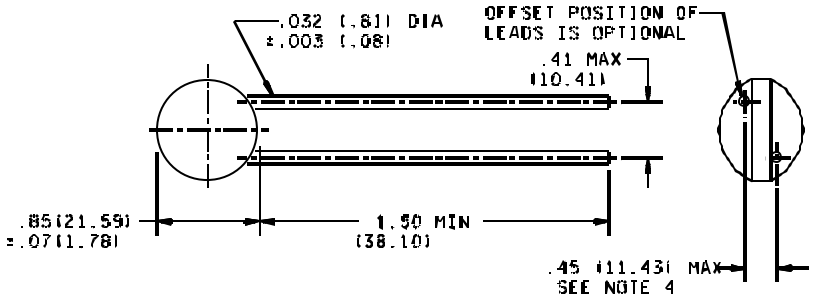
3.1 Requirements. Requirements shall be in accordance with MIL-PRF-23648, and as specified herein.

3.2 Interface and physical dimensions. The thermistors shall meet the interface and physical dimensions as specified on figure 1 and herein.

3.3 Thermal time constant. The thermal time constant shall be 80 seconds maximum.

3.4 Dissipation constant. The dissipation constant shall be 5 milliwatts per degrees Celsius minimum.

3.5 Power rating. The thermistor shall be capable of dissipating a maximum power of 1.5 watts at 25°C. Thermistors shall be derated in accordance with figure 2.



NOTES:
1. Dimensions are inches.
2. Millimeters are in parentheses.
3. Metric equivalents are given for general information only.
4. This dimension is lead separation only (measured across solder joints) and will vary with resistance.

FIGURE 1. Style RTH10 thermistors.

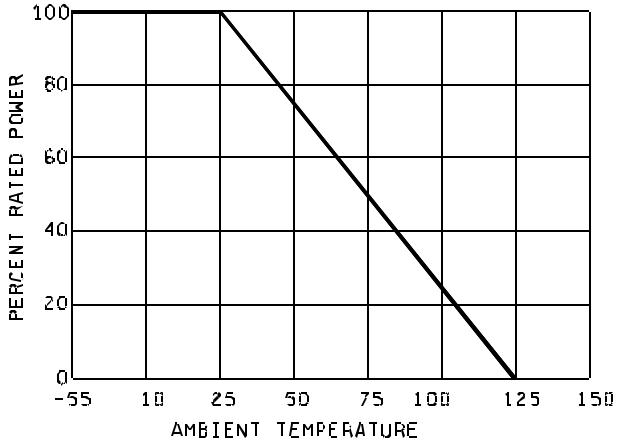


FIGURE 2. Derating curve for high ambient temperatures.

3.6 Resistance.

3.6.1 Resistance at 25°C. Standard values shall be as specified in MIL-PRF-23648 except that the 5 percent decade values shall also be used for resistance tolerances F and G. Minimum and maximum resistance values shall be in accordance with table I.

TABLE I. Minimum and maximum resistance values (at 25°C) for each available resistance ratio.

Ratio 19.8 (A)	Ratio 29.4 (B)	Ratio 48.7 (C)
ohms 10 min 82 max	ohms 68 min 330 max	ohms 1k min 6.8k max

3.6.2 Resistance at temperatures other than 25°C. Resistance at temperatures other than 25°C are determined by multiplying the zero power resistance at 25°C by the factors shown in table II for the applicable resistance ratio.

TABLE II. Resistance temperature characteristic factors.

Temperature	Ratio 19.8 (A)	Ratio 29.4 (B)	Ratio 48.7 (C)
°C	ohms	ohms	ohms
-55	54.9	100	
-15	5.77	7.38	8.80
0	2.85	3.27	3.66
25	1.00	1.00	1.00
50	.405	.360	.320
75	.184	.148	.116
100	.0923	.0675	.047
125	.0503	.0340	.0205

3.7 Short time overload. The maximum allowable change in zero power resistance as the result of the short time load test shall be ±2 percent.

3.8 Low temperature storage. The maximum allowable change in zero power resistance as the result of the low temperature storage test shall be ±2 percent.

3.9 High temperature storage. The maximum allowable change in zero power resistance as the result of the high temperature storage shall be ±1 percent.

3.10 Terminal strength. When tested in accordance with 4.2, the maximum allowable change in zero power resistance shall be ±1 percent.

3.11 Thermal shock. The maximum allowable change in zero power resistance as the result of the thermal shock test shall be ±2 percent.

3.12 Resistance to soldering heat. The maximum allowable change in zero power resistance as the result of the resistance to soldering heat test shall be ±1 percent.

3.13 Moisture resistance. The maximum allowable change in zero power resistance as the result of the moisture resistance test shall be ±5 percent.

3.14 Life. The maximum allowable change in zero power resistance as the result of the life test shall be ±5 percent.

3.15 High temperature exposure. The maximum allowable change in zero-power resistance as the result of the high temperature exposure test shall be ±1 percent after 100 hours, and ±2 percent after 1,000 hours.

3.16 Vibration, high frequency. The maximum allowable change in zero-power resistance as the result of the vibration test shall be ±2 percent.

3.17 Shock, specified pulse. The maximum allowable change in zero power resistance as the result of the shock test shall be ±2 percent.

3.18 Immersion. The maximum allowable change in zero power resistance as the result of the immersion test shall be ±3 percent.

4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-PRF-23648.

4.2 Terminal strength.

4.2.1 Direct load. Direct load shall be applied gradually until the load reaches 4.5 pounds.

4.3 Solderability. The solderability test is applicable to this specification except the steam aging requirement shall be 60 minutes +5 minutes, -0 minutes.

4.4 Resistance to soldering heat. The resistance to solder heat is applicable to this specification.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or purchase order. When actual packaging of materiel is to be performed by DoD personnel these need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The notes specified in MIL-PRF-23648 are applicable to this specification.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of the specification.

b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1).

c. Packaging requirements (see 5.1).

Custodians:
Army – CR
Navy – EC
Air Force – 11
NASA – NA
DLA – CC

Review activities:
Army – AR, AT, AV
Navy – AS, CG, MC, OS
Air Force – 19

Preparing activity:
DLA – CC

(Project 5905-1647-02)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE
	MIL-PRF-23648/3E	11 October 2002

3. DOCUMENT TITLE

Resistors, Thermal (Thermistor) Insulated, Negative Temperature Coefficient, Style RTH10.

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) Commercial DSN FAX EMAIL	7. DATE SUBMITTED

8. PREPARING ACTIVITY

a. Point of Contact Defense Supply Center Columbus ATTN: DSCC-VAT	b. TELEPHONE Commercial 614-692-0552 DSN 850-0552 FAX 614-692-6939 EMAIL Resistor@dscc.dla.mil
c. ADDRESS PO Box 3990 Columbus, OH 43216-5000	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Standardization Program Office (DLSC -LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvior, Virginia 22060-6221 Telephone (703) 767-6888 DSN 427-6888